Amendments to the Drawings:

The attached sheet(s) of drawings include changes to Figs. 2, 4, 5B and 7. Replacement Sheets providing Formal Drawings for all the figures are provided.

Remarks

Claims 1-54 are pending in the present application and are rejected. Claims 1-15, 17-43, and 45-54 are rejected. Claims 16 and 44 are objected to.

Claim 1 is amended to include as a limitation "the gas flowing from a nozzle placed within the channel." Claims 22, 36, and 47 are similarly amended to include the limitation "the working gas flowing from a nozzle placed within the channel." The antecedent basis for these amendments is found on page 7, ll. 8-16.

Claim 17 is amended to insert "block" after "second insulating."

In the Specification, the paragraph beginning at page 6, l. 19 is amended to replace redundant item number 12 and 14 with 13 and 15. The paragraph beginning at page 12, l. 14 is amended to replace "comprising comprising" with "comprising." Table 1 beginning at page 15, l. 11 to replace "copper oxide films" with "copper films." This corrects an obvious error since Example 1 deals with copper films.

In the Drawings, Figure 2 is amended to replace redundant item numbers 12 and 14 with 13 and 15. Similarly, Figure 4 is amended to replace a redundant occurrence of "34" with "36". Figure 5B is amended to replace redundant occurrences of items 106 and 110 with 100 and 102. The appropriateness of this correction is evident from the Specification on p. 13, ll. 26-28 which states:

> Water is introduced into copper cooling block 96 through teflon tube 98 which snakes through leak tight adapter 100. Teflon tube 98 attaches to copper cooling block 96 via connector 102.

Figure 5B is further amended to remove item number 120.

Figure 7 is amended to correct two obvious errors. The units of the x-axis are corrected to be "slm." This is clear from the other examples and Figures in the Specification. In particular, the Examiner is directed to Example 6 in which zinc oxide is grown with only a small amount of dopant. Moreover, one skilled in the art would know that the units must be slm as units of sccm would give vanishing low film growth. Figure 7 is further amended to indicate that the units are "a.u." This again, obvious from the other examples and figures.

1. Drawings

The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: 36 (see page 9, line 30); 100 (see page 13, line 27); and 102 (see page 13, line 28). As set forth above, these items have been corrected.

2. Specification

The disclosure is objected to because of the following informalities: "comprising comprising" on page 12 at line 23. As set forth above, the Applicant has corrected this informality.

3. Claim Objections

Claim 17 is objected to because of the following informalities: "block" needs inserted after "second insulating" in claim 17 at line 3. Applicant has corrected this informality.

Claims 16 and 44 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Claims 16 and 44 now depend from allowable claims as set forth below.

4. Rejection Under 35 U.S.C. §102(b)

Claims 1-9, 11-15, 18-26, 29-34, 36-43, 45, and 46 are rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 6,150,030 to Stollenwerk et al. ("Stollenwerk").

Independent claims 1, 22, 36, and 47 are amended such that it is clear that the working gas emanates from a nozzle placed in the channel defined by one or more target surfaces. Stollenwerk does not disclose this arrangement which is important in obtaining the benefits of the present invention. Stollenwerk provides little disclosure about the utilization of turbulence. In fact, Stollenwerk only mentions turbulence twice:

> An inventive and preferred coating arrangement for preferably performing the inventive method is proposed which comprises:
>
> two Mg-targets mutually defining a slit and made of Mg-material with a purity of at least 99%;
>
> at a first end area of the slit an anode arrangement and a gas feed arrangement connected to a gas tank arrangement containing a working gas, **the gas nozzles of which being so directed that the gas is inlet not directly between the targets but towards the end thereof so as to result in turbulences**;
>
> a substrate carrier and conveyor arrangement with which a planar substrate is moved over and past said slit, distant from a second slit end area which is opposite to said first slit end area;
>
> a further gas feed arrangement acting into the space between said second slit end area and said substrate carrier and conveyor arrangement, which further gas feed arrangement being connected to a gas tank arrangement for a reactive gas containing oxygen.
>
> Stollenwerk, col. 3, ll. 28-47

Clearly, Stollenwerk teaches away from forming turbulence (i.e., non-laminar flow) as required by amended claims 1, 22, 36, and 47 which require that the nozzle that introduces the working gas be positioned in the target channel.

The second instance of turbulence in Stollenwerk is completely irrelevant to the present invention. In this instance, turbulence outside of the target channel is discussed:

> At that end area of the slit which is opposed to the gas feed arrangement 7 there is provided a further gas feed arrangement 11. This further gas feed arrangement, as again schematically shown, is connected with a gas tank 13 via an adjusting member 13a, which gas tank 13 contains oxygen. The gas feed arrangement 11 is so construed and its gas nozzles are so directed that the gas does not directly flow between the targets, but into the end area of the targets so as to result in **turbulences**.
>
> Stollenwerk, col. 4, ll. 49-58

The present invention involved the formation of non-laminar flow within the target channel and not outside of the target channel as mentioned in this second instance in Stollenwerk.

Accordingly, claims 1-9, 11-15, 18-26, 29-34, 36-43, 45, and 46 are allowable under 35 U.S.C. 102(b) over Stollenwerk.

5. Rejection Under 35 U.S.C. §103(a)

Claim 10 rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 6,150,030 to Stollenwerk et al. ("Stollenwerk") in view of U.S. Patent No. 5,810,982 to Sellers ("Sellers").

Claim 10 depends from claim 1 which is demonstrated above to be allowable. Moreover, Stollenwerk is shown above to be a deficient reference with regards to the present invention. Accordingly, claim 10 is allowable over Stollenwerk in view of Sellers.

Claims 1-9, 11-15, 18-43, and 47-54 rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,889,295 to Rennie et al. ("Rennie") in view of Stollenwerk.

The Examiner relies on Stollenwork as above. Accordingly, for the same reasons as set forth above, claims 1-9, 11-15, 18-43, and 47-54 are allowable under 35 U.S.C. 103(a) over U.S. Patent No. 5,889,295 over Rennie in view of Stollenwerk.

Conclusion

Applicants have made a genuine effort to respond to each of the Examiner's rejections in advancing the prosecution of this case. Applicants believe that all formal and substantive requirements for patentability have been met and that this case is in condition for allowance, which action is respectfully requested. If a telephone or video conference would help expedite allowance or resolve any additional questions, such a conference is invited at the Examiner's convenience.

A check in the amount of $510.00 is enclosed to cover the fee for a Petition for a Three-Month Extension of Time. Please charge any additional fees or credit any overpayments as a result of the filing of this paper to our Deposit Account No. 02-3978.

Respectfully submitted,

Alan E. Delahoy et al.

By _____
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Reg. No. 47,010
Attorney/Agent for Applicant

Date: October 18, 2005

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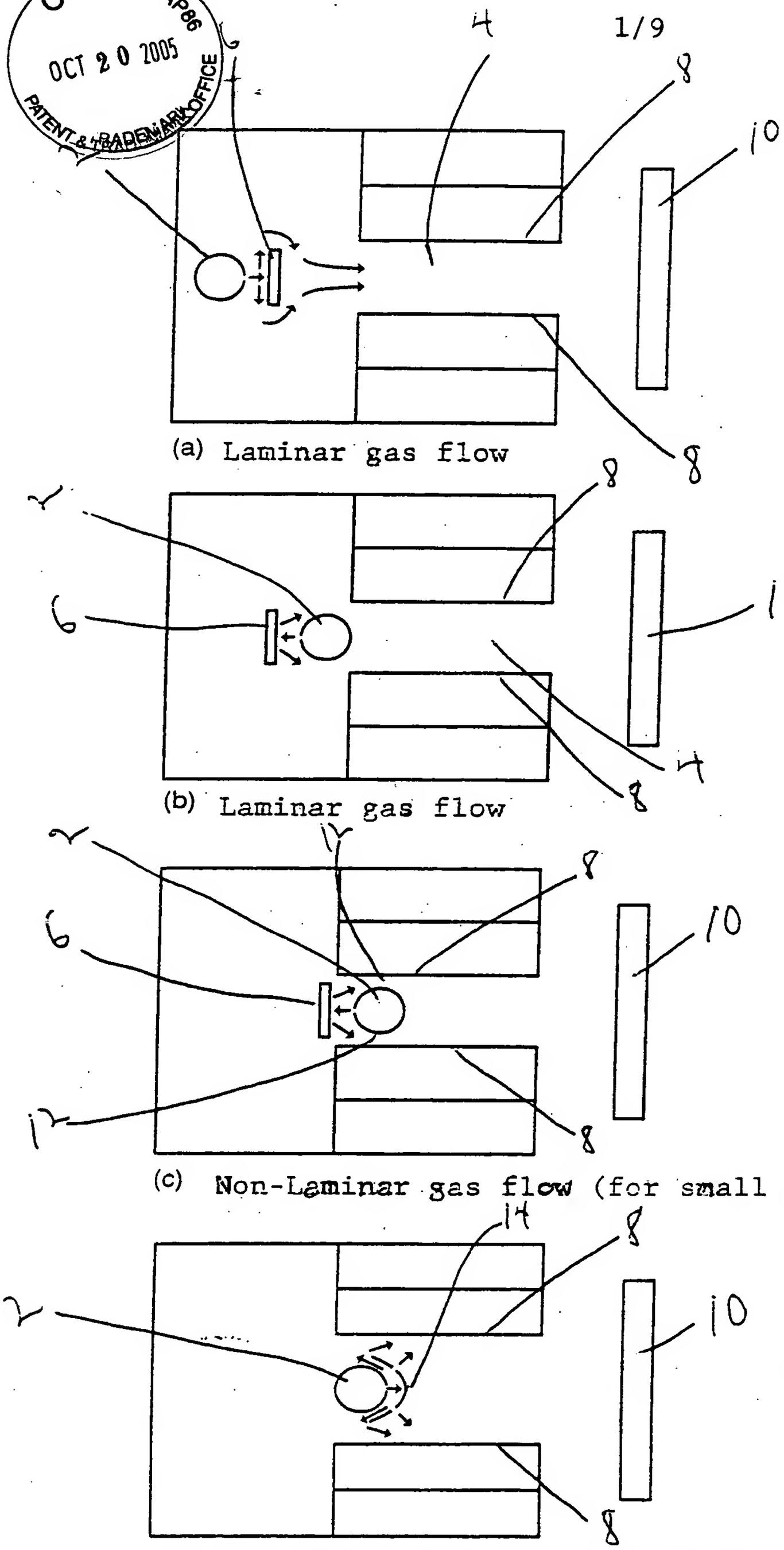


Figure 1

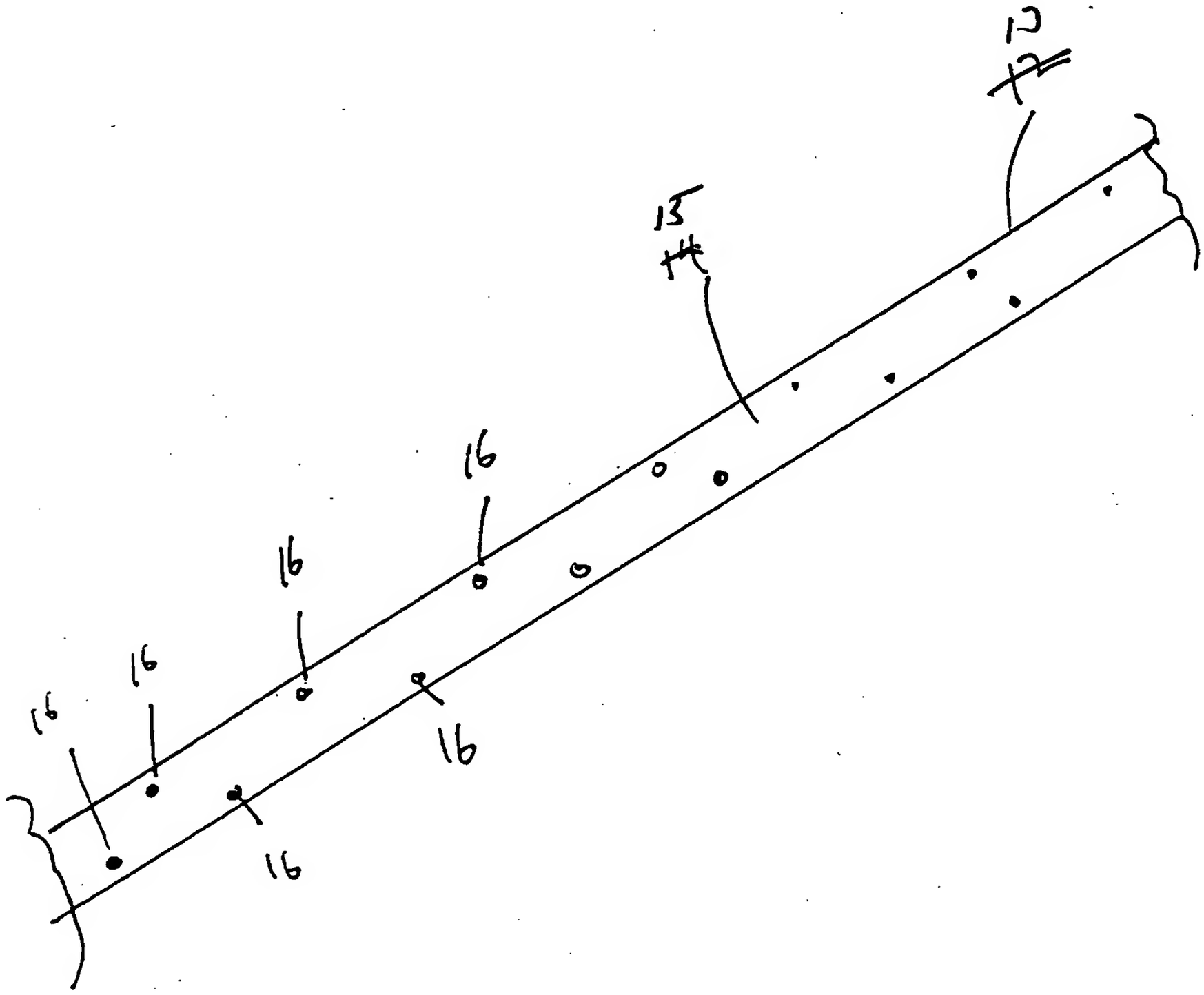


Figure 2

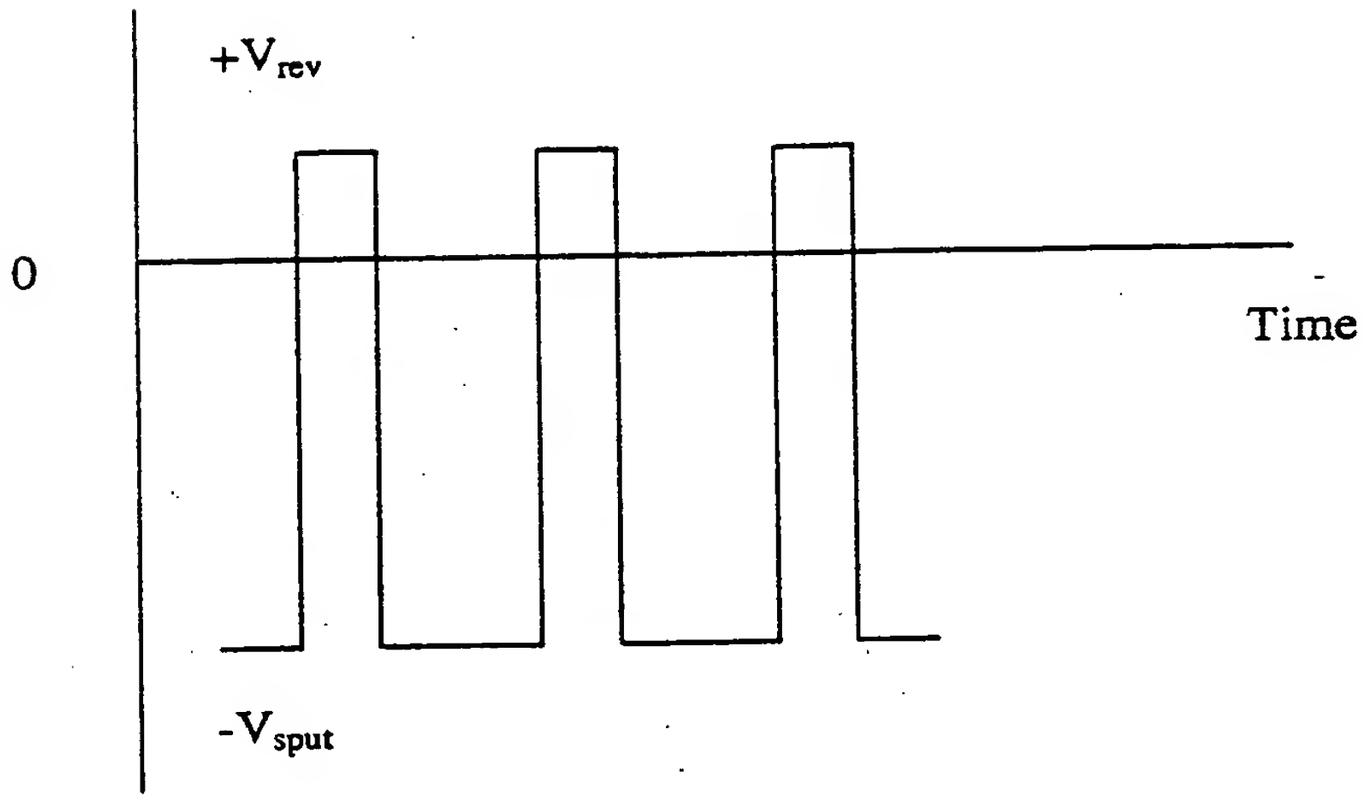


Figure 3

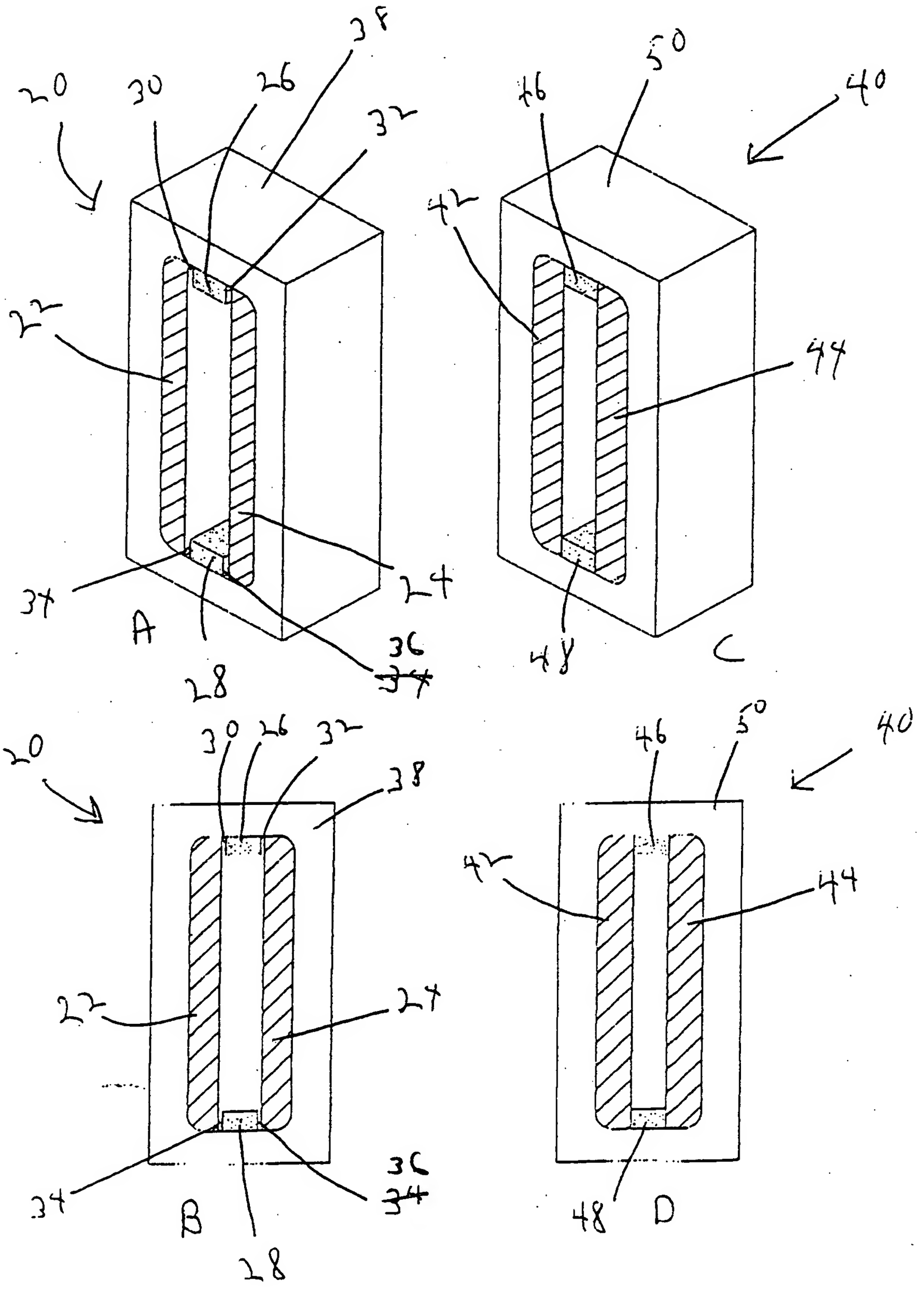


Figure 4

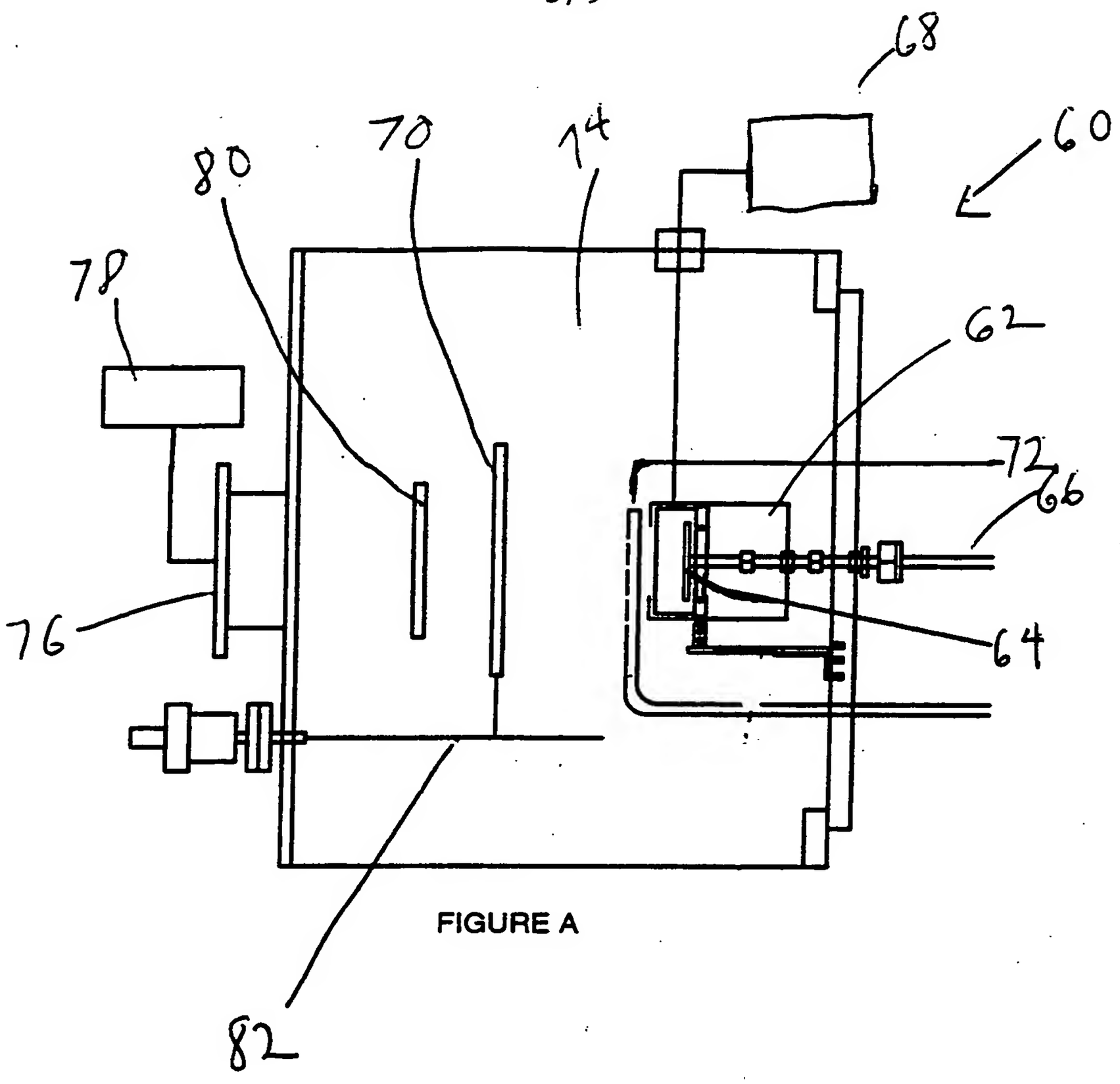


FIGURE A

Figure 5A

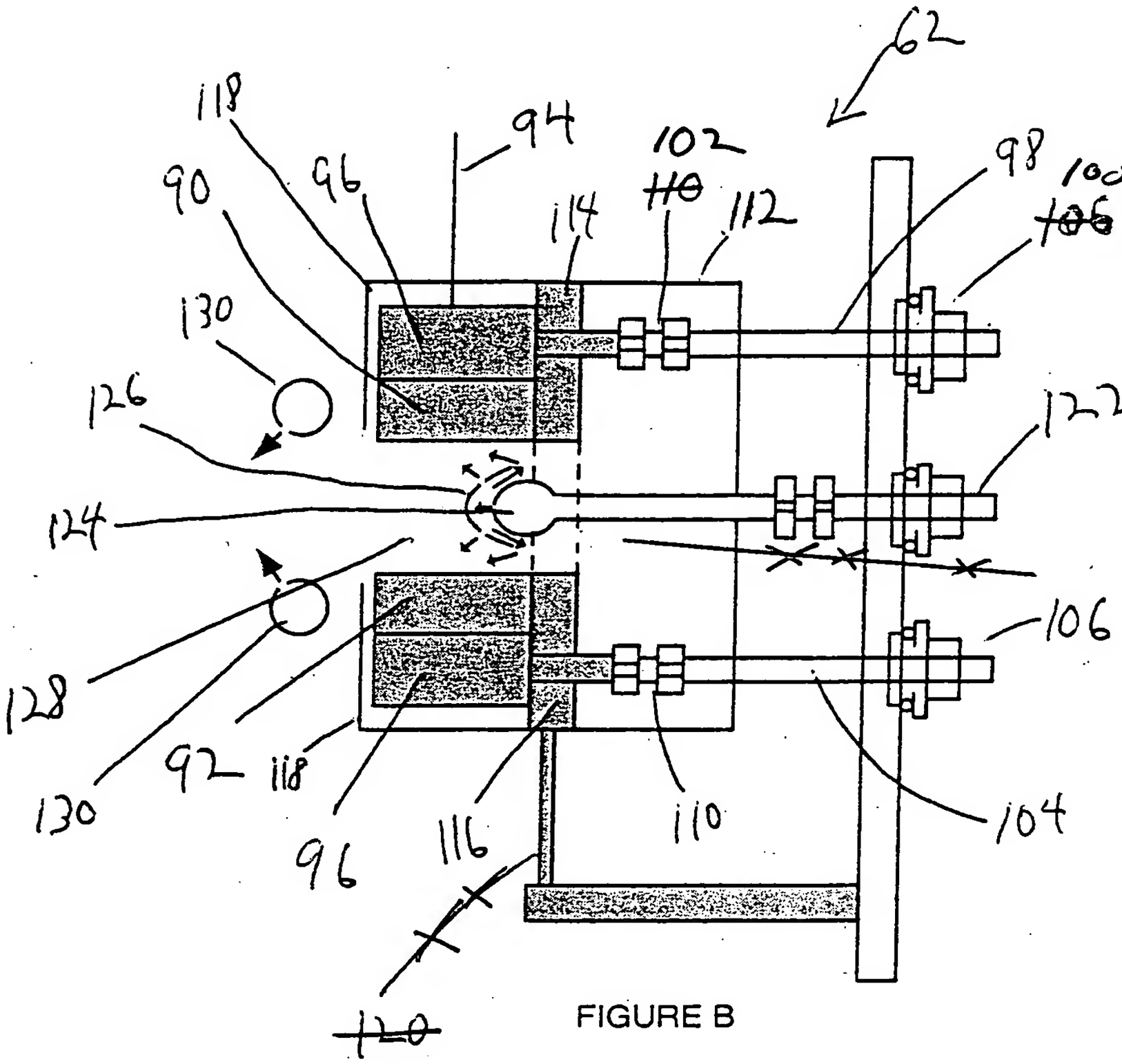
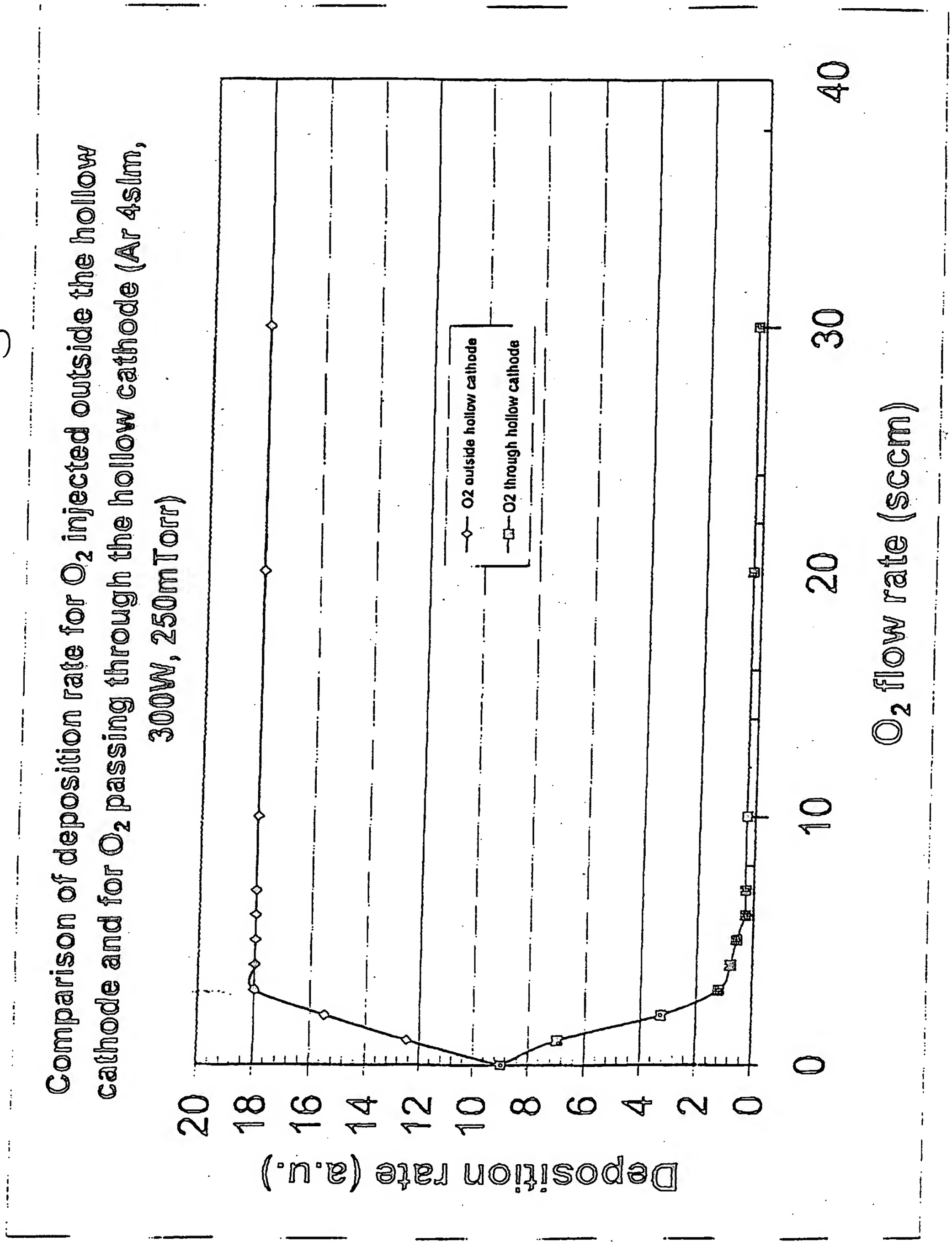


FIGURE B

Figure 5B

Figure 6


Comparison of deposition rate for O_2 injected outside the hollow cathode and for O_2 passing through the hollow cathode (Ar 4slm, 300W, 250mTorr)
O2 outside hollow cathode
O2 through hollow cathode
Deposition rate (a.u.)
O_2 flow rate (sccm)
0
2
4
6
8
10
12
14
16
18
20
0
10
20
30
40

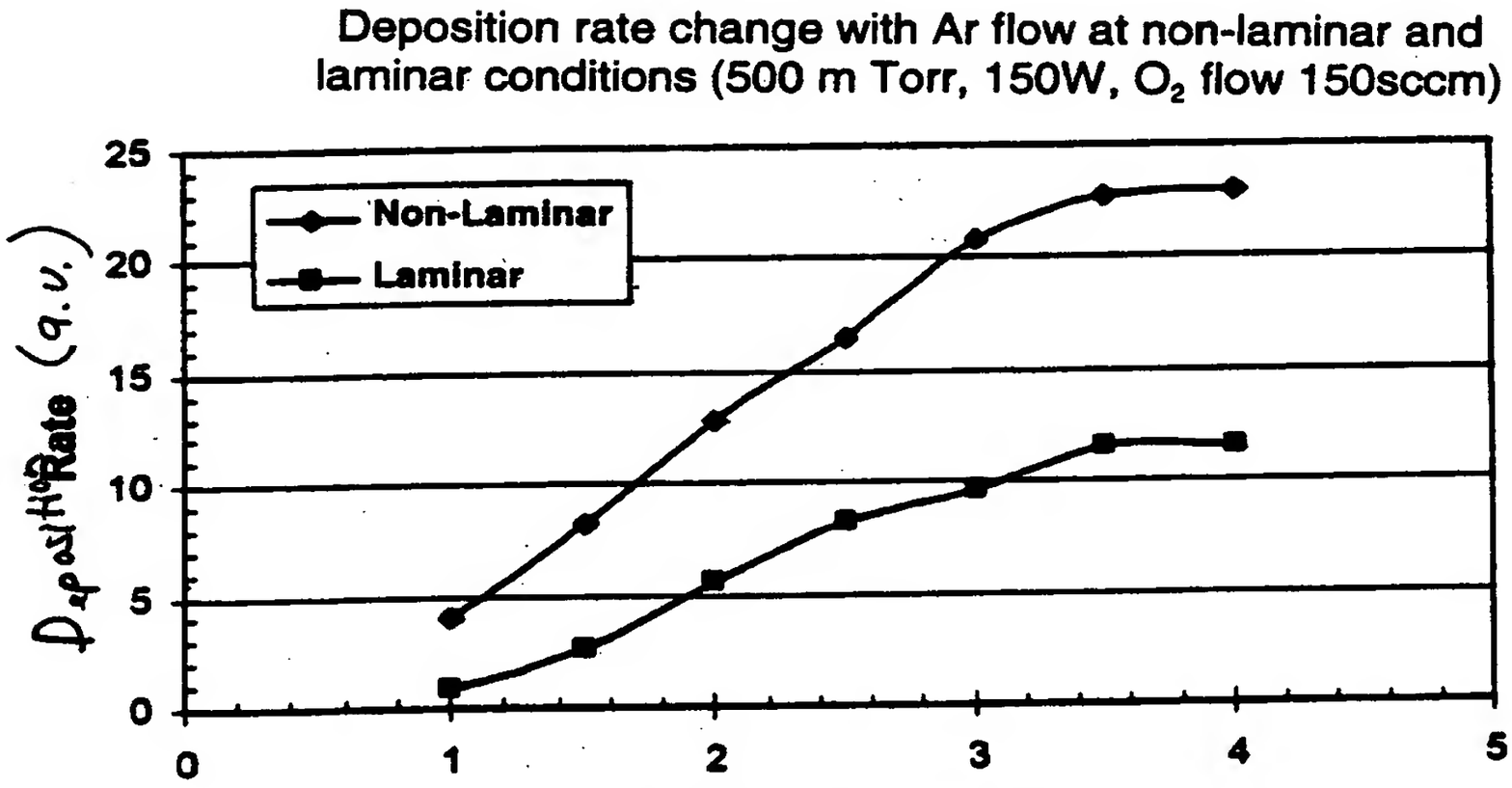

Deposition rate change with Ar flow at non-laminar and laminar conditions (500 m Torr, 150W, O_2 flow 150sccm)
Non-Laminar
Laminar
Deposition Rate (a.u.)
25
20
15
10
5
0
0
1
2
3
4
5
Ar flow rate (~~sccm~~)
SLM

Figure 7

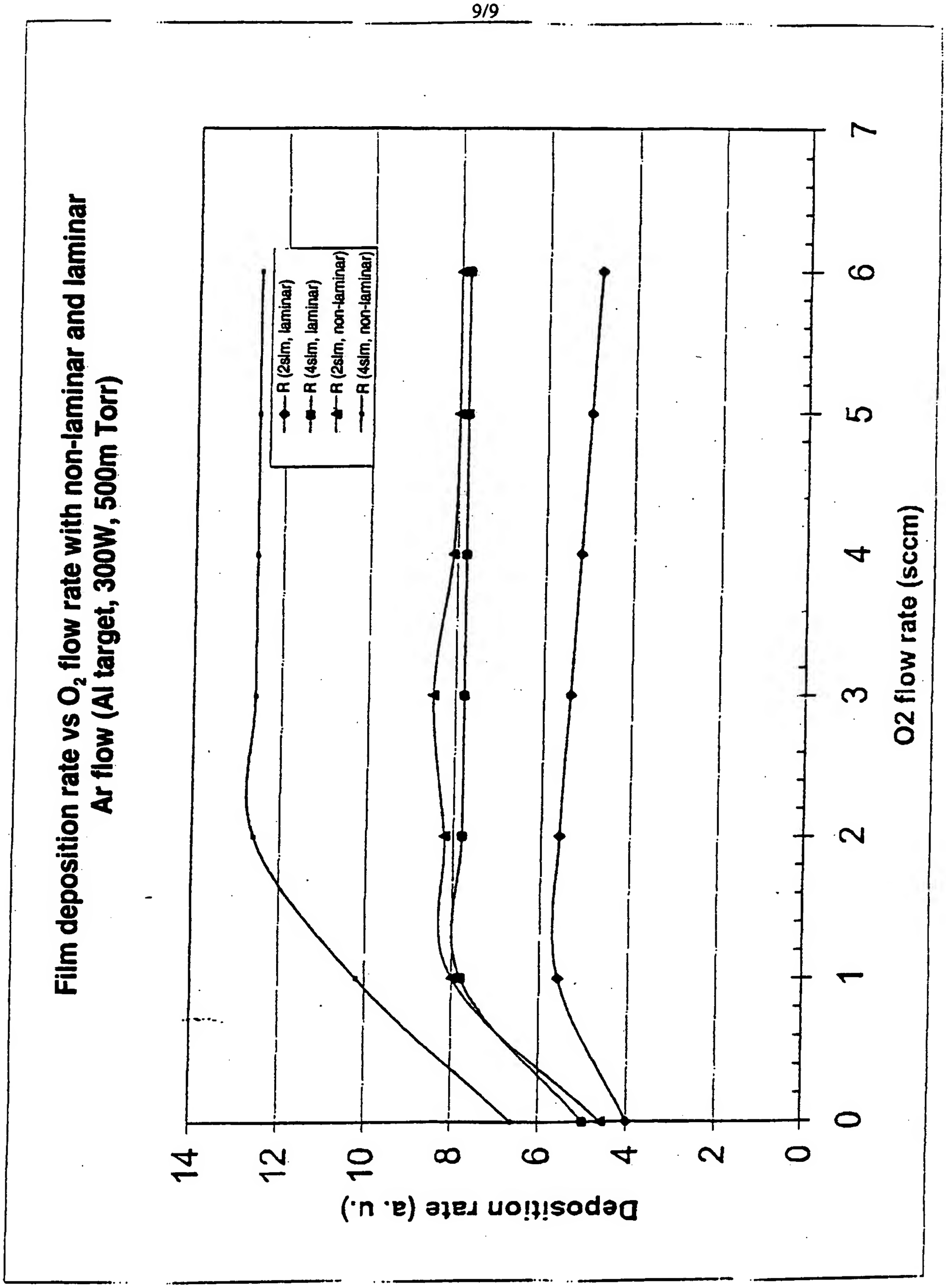

Film deposition rate vs O2 flow rate with non-laminar and laminar
Ar flow (Al target, 300W, 500m Torr)
R (2slm, laminar)
R (4slm, laminar)
R (2slm, non-laminar)
R (4slm, non-laminar)
Deposition rate (a. u.)
O2 flow rate (sccm)
0
2
4
6
8
10
12
14
0
1
2
3
4
5
6
7

Figure 8